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OXYGEN-18 VARIATION IN LAKE LAHONTAN, LAKE RUSSELL AND OWENS LAKE DURING THE LAST GLACIAL-INTERGLACIAL TRANSITION

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Increased streamflow discharge to a hydrologically closed lake results in an increase in lake size and an abrupt decrease in the $\delta^{18}O$ value of lake water. As the closed lake approaches steady state with respect to the new hydrologic balance, the $\delta^{18}O$ value of lake water returns to its original value. Increased discharge to a hydrologically open lake results in more water being spilled from the lake basin and a stable decrease in $\delta^{18}O$; the greater the volume of spill the lighter the value of $\delta^{18}O$. The history of $\delta^{18}O$ variation in lake water is recorded in carbonates that precipitated from lake water. In principal, the record of oscillation between closed and open hydrologic states as well as the record of change in lake level can be estimated from $\delta^{18}O$ values of the lake-sediment carbonate fraction. Continuous $\delta^{18}O$ records for the glacial-interglacial transition have been obtained for Lake Lahontan, California and Nevada, Lake Russell, California, and Owens Lake California. Abrupt decreases in $\delta^{18}O$ in all three lake systems can be associated with Heinrich events H1 and H2. Given errors in ^{14}C dating of lake and marine sediments, a case can be made that abrupt decreases in $\delta^{18}O$ in the lake records also accompany Heinrich events H3 and H4. We believe that the Heinrich events, which signal changes in the configuration of the Laurentide ice sheet, may be linked to abrupt changes in Great Basin lake levels via the influence of the ice sheet on the position of the polar jet stream. Numerous oscillations not associated with the Heinrich events also occur in the $\delta^{18}O$ records.

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